probably occurs through the respiratory organ, and is according to the simple laws of diffusion. On the other hand, the blood of sea-fishes, has an entirely different saline composition from that of the water; it is more or less isolated, presenting herein an evident superiority over the invertebrates referred to.—*Nature.*

PSYCHOLOGY.

ANECDOTE ABOUT CATS.—Incidents showing some power of reason are often related of animals, especially those domesticated; but I do not think the following have ever appeared in print: Near Vineland, N. J., some boys discovered a woodchuck's burrow (*Arctomys monax* L.), containing both adults and four young. The father and two of the young were killed; the mother and the other two young were taken home, and imprisoned. During the night the mother made her escape. As a matter of experiment, the young were placed with a cat, at that time suckling her two kittens. Shortly after the cat came into the house somewhat uneasy. One of the boys went out with her to the novel family, and finally succeeded in pacifying her to such an extent that she allowed the strangers to suckle. But now a new difficulty arose. There were but two teats sufficiently developed to afford nourishment. A struggle ensued as to who should obtain possession. The woodchucks being the stronger, came off victorious. The kittens showed their dislike to this arrangement by scratching and pushing, and as it was evident that two of the four must be removed, a decision was given in favor of the woodchucks. Shortly after, one of them died; whether the other ever reached maturity or not, I do not know, but understood that it continued to suck the cat for some time. That cats are not always so accommodating as the above individual, I know from the fact, that once when I endeavored to have a cat with three kittens assume charge of two more, I was obliged to hastily withdraw them to prevent their being killed. In another case one kitten was nourished by two cats. As to whether either was the parent or not, I cannot say. Once when the mothers desired to remove their child from the mill where it was then located, to a neighboring house, they found their infant, corpulent with the abundant nourishment, too heavy for either alone, and consequently were obliged to carry it between them.—*Henry Turner.*

THE MODIFIED INSTINCTS OF A BLIND CAT.—Mr. H. C. Hovey contributes to the *Scientific American* the following interesting article on the modified instincts of a blind cat. The family favorite, whose misfortunes have afforded an opportunity to observe the workings of instinct under difficulties, is a noble specimen of the genus Felis. "Dido" is his name—given for simple euphony, without regard to gender. During the four years of his life he has never been known to do anything wrong, unless it be to fight

most desperately against all feline intruders. In some one of his many encounters, Dido met with an injury to one of his feet that made a surgical operation necessary, from which he recovered, but shortly afterward went totally blind. A cataract was formed over each eye, by which, as repeated experiments proved, vision was thoroughly obscured.

This calamity came on suddenly, and placed the cat in circumstances not provided for by the ordinary gifts of instinct. What to do with himself was plainly a problem hard to be solved. He would sit and mew most piteously, as if bemoaning his condition; and when he attempted to move about, he met with all the mishaps that the reader will be likely to imagine. He ran against walls, fell down stairs, stumbled over sticks, and when once on the top rail of the fence, he would traverse its entire length seeking in vain for a safe jumping off place. On being called, he would run about bewildered, as if not knowing whence the voice came nor whither he should go to find the one calling. In short, Dido's life seemed hardly worth living, and we were seriously plotting his death, when the cat himself clearly concluded that he must make his other senses atone for the loss of sight.

It was very curious to watch his experiments. One of the first of these was concerning the art of going down stairs. Instead of pawing the air, as he had been doing on reaching the top step, he went to one side till he felt the banisters touch his whiskers, and then, guided thus, he would descend safely and at full speed, turning into the hall on gaining the last step. One by one he made each familiar path a study, determined the exact location of each door, explored anew all his old haunts, and seemed bravely resolved to begin life over again. The result was so unexpectedly successful that we were deceived into the notion that sight had been restored. But by placing any obstacle in the path, and then calling him eagerly to his customary feeding place, it was evident that he was entirely blind, for he would run with full force against the box or other obstruction, and then, for some time afterward, he would proceed with renewed caution.

Dido's "voice is still for war," and his blindness does not make him any less successful in his duels with intruders. He even goes abroad in quest of adventures, and comes safely home again.

His value as a mouser does not seem to be in the least diminished. One of my experiments as to his capacity in this direction came near costing me dear. I had heard the gnawing of a rat in an old closet where there lay a quantity of newspapers. Here it was decided to leave Dido over night, and while arranging the papers for that purpose, my hand was suddenly caught by the claws and teeth of what at the moment seemed like a small tiger. Poor Dido! He really looked ashamed of his blunder in mistaking my hand for his anticipated victim. Fortunately the papers served as a shield, or the injury inflicted might have been more

serious. I may add that, on opening the closet next morning, there was Dido mounting guard over a slain rat as big as ever spoiled good provisions or tried a housekeeper's temper.

It is well known that the house-cat will find its way back from distant places to which it has been carried blindfolded; and how it performs such feats naturalists have never satisfactorily explained. The theory accepted by some of them is that the animal takes note of the successive odors encountered on the way, that these leave as distinct a series of images as those we should receive by the sense of sight, and that, by taking them in the inverse order from that in which they were received, he traces his homeward route.

But, in the cat now described, the sense of smell is by no means acute, as has been proved by a variety of methods; and moreover, although, as one might say, perpetually blindfolded, he quite uniformly chooses the shortest road home without reference to the path he may have taken on leaving the house. Curious to see how far this homing instinct would extend, I took advantage of a fall of snow that wrapped under its mantle every familiar object, concealed all the paths, and deadened every odor and sound. Taking Dido to a considerable distance from the house, and making a number of turns to bewilder him, I tossed him upon a drift and quietly awaited results. The poor creature turned his sightless orbs this way and that, and mewed piteously for help. Finding, at length, that he was thrown entirely on his own resources, he stood motionless for about one minute, and then, to my amazement, made his way directly through the untrodden snow to the house door—which, it is needless to add, was promptly opened for the shivering martyr to scientific investigation, to whom consolation was forthwith offered in a brimming bowl of new milk.

My conclusion, therefore, is that Wallace's ingenious theory of accounting for orientation by what he calls "brain registration," will not explain what has been described; but that the mysterious homing faculty is probably independent of such methods of gaining knowledge as have been ordinarily observed, and is analogous to the migratory instinct controlling the long flights of some species of birds.

ADDITIONAL REMARKS RELATIVE TO TEACHING BRUTES THE USE OF LETTERS.—In the article published in the January number of the NATURALIST, I endeavored to indicate very briefly the method to be pursued in a suggested investigation into the limitations of the mental action of brutes. From some comments upon the article I have been led to believe that it would be acceptable to some of your readers to add a brief supplement relating to further details.

If dogs were the subjects chosen for experiments as suggested—

they being best adapted to the purpose from several points of view—a number of both sexes would be secured; the most intelligent individuals of the most intelligent species being selected; probably that known as "French poodle." They would be taught in classes in order to profit by ambition and example; and a judicious system of rewards and punishments adopted. The intelligent and healthy would be mated; the stupid or weakly would be discarded.

In each generation the standard of ability being raised as the circumstances justified, the law of adaptation would be brought to bear in conjunction with artificial selection.

Then the laws of heredity would be so followed as to render probable the production of exceptional individuals in the direction desired; thus profiting by the tendency to radical variation to secure a new variety of exceptional capabilities.

Is it not possible that inquiries into the operation of the lower orders of mind may suggest improvements in the training of the higher grades?—*Wm. B. Cooper.*

[NOTE BY THE EDITORS.—A valuable article on this subject appeared in the number of the London *Journal of Science*, corresponding to the number of the NATURALIST in which Mr. Cooper's article was published, viz. Jan. 1883. Mr. Cooper's present note expresses recommendations contained in the *Journal of Science* article, which, however, prefers parrots to dogs as the best animals for experiment.]

ANTHROPOLOGY.[1]

ETHNOLOGY OF THE VEGA.—All the world has read the story of the *Vega*, how the brave Nordenskjöld in the steamer *Vega*, setting sail from Tromsö, in Northern Norway, on the 21st July, 1878, explored the entire arctic coast of Europe and Asia, wintered for ten months in Kolyutschin bay, and returned by Behring strait and the Suez canal to the point of departure. It is not our province to dwell upon the brilliancy or the value to commerce and material science of this first circumnavigation of Europe and Asia. In the course of his journey Nordenskjöld was brought into close relationship with the inhabitants of the high north, and it is with this portion of his work that we have to do.

Samoyeds (Mongoloid division, Ural-Altaic stem, Samoyed branch. *Peschel*).—Of these people Nordenskjöld says: "The Samoyeds, living neighbors to several Finnish-Ugrian races (Lapps, Syrjæni, Ostjacks and Voguls) are believed by some writers to be closely allied to the Fins and Finnish races in general. The comparison of the languages, however, shows a very wide divergence, and the anatomical characters have not been sufficiently scrutinized." These people were met with along the

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